

Phys.
Lab.

Bowditch (H. P.)



XXIII.

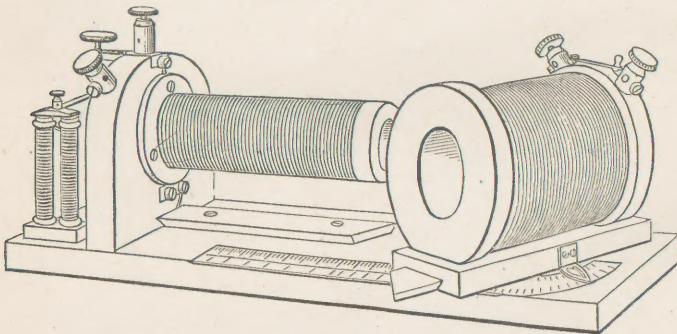
A NEW FORM OF INDUCTIVE APPARATUS.

By HENRY P. BOWDITCH.

Presented, Oct. 12, 1875.

THE inductive apparatus commonly used in physiological laboratories is the so-called "Sledge Apparatus" of Du-Bois Reymond. In this instrument, the intensity of the induced current is regulated by varying the distance between the two coils, their axes being always kept in the same straight line. By this method, very feeble currents can only be obtained by separating the coils to a considerable distance, and an instrument made to permit this separation has often an inconvenient length.

In the instrument here presented, and which is figured in the accompanying wood cut, this difficulty is obviated by allowing the secondary coil, as soon as it has been withdrawn enough to be fairly free of the primary coil, to rotate round a vertical axis. In this way,



the intensity of the induced current may be reduced to any desired degree, zero being obtained when the coils are at right angles to each other. The effect of simple rotation of the secondary coil, regarded by itself, would doubtless be to cause the intensity of the induced current from that coil to vary in the same proportion with the cosine

of the angle of rotation. This effect is, however, complicated by the variation in the distance of the different parts of the two coils from each other which attends this rotation. It is accordingly found that the curve which represents the actual variations in intensity (obtained, according to Fisk's method, by measuring with the galvanometer the intensity of single induction shocks at every ten degrees of revolution of the secondary coil *) differs from the curve of cosines in being slightly convex towards the abscissa just before it reaches that line.

The scale with which the instrument is provided indicates the intensity of the induced current at different positions of the secondary coil, expressed in terms of an arbitrary unit employed in the graduation of a large "sledge apparatus," in use at the physiological laboratory, and similar to the unit adopted in German laboratories for the graduation of similar instruments.

* See Cyon's *Methodik der physiologischen Experimente*, p. 379.

